

THE BASICS OF
CHEATING

at

BACCARAT



PRESENTED BY
eConnect and Malcolm Rutherford

THE GAME OF **BACCARAT**

Baccarat is an old game and while its provenance is in some dispute it appears to have originated in either Italy or France toward the end of the period that we call the Middle Ages or the beginning of the Renaissance.

It is also a remarkable simple card game with a fixed Tableau, that is drawing rules, to determine when the cards are drawn and when they are not. It is not the purpose of this document to detail how the game is played, but rather to details some of the ways that it is vulnerable to exploitation by cheats or advantage players.

While there are several superficially different versions of the standard game these differences are all accounted for by alternate payment options, not by the Tableau being different, so all of the games suffer from the same vulnerabilities.

The fixed nature of the Tableau is of vital importance for many of the exploits that will be discussed below.

BACCARAT AND **CARD COUNTING**

Is not practical.

While, as a card game, Baccarat should be theoretically deterministic in the same manner as Blackjack the fixed Tableau and the existence of effectively only three main betting positions and only one dealt hand, no matter the numbers of players at the table, combine to make it no so. Therefore Baccarat can be considered along with games such as Craps and Roulette as a non-deterministic game and as such it can be analysed with standard statistical models and plotted against the "normal" curve.

It has been shown that Baccarat can be counted, in theory, but the advantages for removing each card from play are so small that in practice many more than eight decks would have to be dealt before any decent advantage accrued and since eight decks is the maximum number played with this game it acts to make Baccarat card-counting impractical.

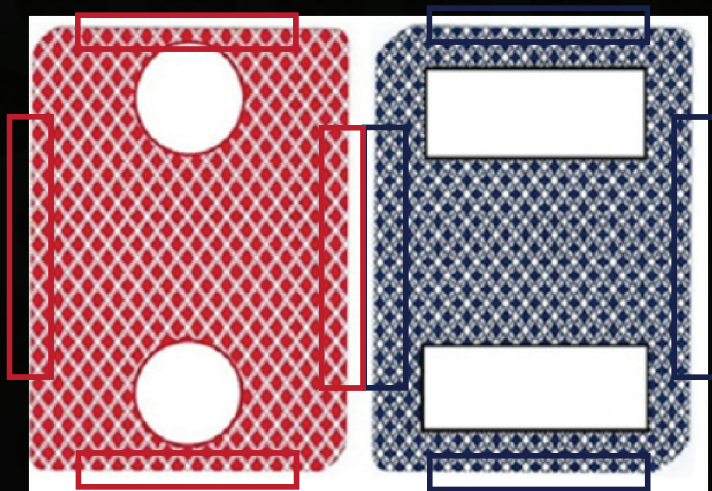
REAL BACCARAT THREATS: **ADVANTAGE PLAY**

EDGE **SORTING**

Topical at present and in the news Edge Sorting can give an advantage player a huge advantage over the House (Casino). Effectively edge sorting is taking advantage of the defects present in how many playing cards are cut and what effect this has on the patterns printed on the card backs. If it leads to noticeable differences, as it does in the illustration below, then this can be used to identify the face value of the card.

The method typically employed to do this would be for a high value player (and because of how the technique interferes with the usual procedures of the game it is almost always something that only a High Roller could even ask for and expect to receive) to ask for a "dry run" of the shoe. In this no wagers are made but the cards are all drawn as they would be, according to the Tableau, as though the game were live. The Advantage Player will request that some cards will be turned or flipped over in a certain way after being exposed and that other cards will be flipped or turned over in a different way.

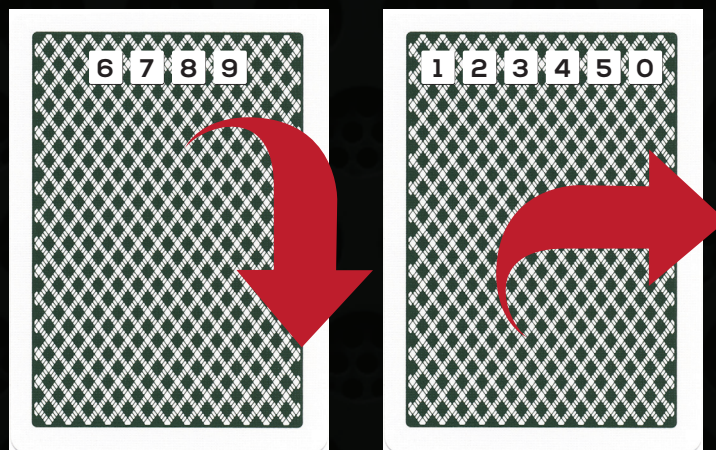
To imagine this in action observe our playing cards below:



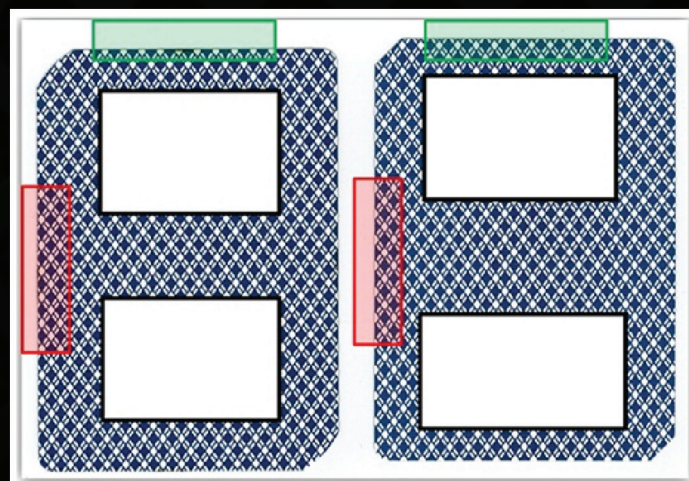
We can see that in the case of the red diamond lattice backs on the left we have full diamonds against the edge of the card on the top and on the left as you look at it and cut diamonds (the whole of the diamond is not visible) to the bottom and to the right.

For the blue diamond backed cards a similar situation applies, just with fuller blue diamonds to the bottom and to the left and cut diamonds to the top and the right.

If this patterning is consistent throughout the deck then the exploit of edge sorting is possible. Let us imagine that we are using the blue backed deck and we are running through the cards looking for these differences. Now we can ask that the exposed cards are flipped back to face down in the following manner



This has now changed our exposed edges as follows. The 6, 7, 8 and 9's are represented on the left, the 1, 2, 3, 4, 5 and 0's on the right. If an automatic shuffler is then used to shuffle up for a new deck; or a manual shuffle without a "turn" (where the orientation of some of the cards turned through 180 degrees) then the exploit is viable.



When these cards are in the shoe then they can be identified by what can be seen of the diamond pattern along the edge and what can be identified has a marked effect on the side that the patron will wager. If we know that the card is a 6, 7, 8 or 9 then a wager should be made on the "Player" while if the known card is anything else the bet should be made on the "Bank".

If the casino allows the first four cards to be drawn before insisting upon a wager then the advantages that can be had are even better, although the methodology is somewhat different: the bets and advantages derived from them can be obtained at <http://apheat.net/2012/08/18/edge-sorting-in-baccarat/> as can the source of the original card image shown above.

Marked cards in Baccarat would effectively be the same exploit without the need for the "run through" but with the disadvantage that the cards would have to be marked.

COUNTERMEASURES

Never let any player, no matter his alleged “value” to the operation have a free run-through of the deck.

Never let the player instruct the dealer or other member of gaming staff on how to flip over any previously exposed card.

Never allow any player to wager when the first four cards have been dealt, even if they have not been exposed.

Use the eConnect Baccarat module and video review to detect “First Card Knowledge”. If any player manages a correlation rate of 80%+ between their actual bets on “Bank” or “Player” and the bet they should have made based upon the exposed value of the first card of the coup to be drawn then this should be considered as being extremely suspicious and this player should be targeted for sustained review

SIDE BET COUNTING

While the game of Baccarat itself is effectively uncountable the same cannot be said of the side bets that have come, increasingly, to feature on every Baccarat table. The major side bets available for Baccarat Advantage Players are:

- The Pairs bet where an extra wager can be made that there will be a pair (i.e. two cards that are the same, two Kings or Queens...etc) dealt to either the Bank or the Player, or both.
- The Dragon Bonus bet where the side bet is one where the margin of the victory (for either the Bank or the Player) is important and is paid on a sliding scale from 30 to 1 for a winning margin of Nine to Even money for a winning margin of Four or for a Natural Win.
- The Dragon 7 and Panda 8 side bets in EZ Baccarat where a winning Bank bet of 7 using three cards pays 40 to 1 or a winning Bank bet of 8 using three cards pays 25 to 1 respectively.
- There are an increasing number of other side bets coming available and all of these should be considered as being potentially vulnerable to card counting.

Side bet counting on baccarat is possible because of a number of factors of the game as it is typically played in a casino environment:

1. The pace of the game is slow.
2. A pen and scorecard are routinely provided, by the Casino, for the use of the Patrons and can therefore be used for whatever they would wish.

The upshot of this is that all of the major side bets are vulnerable to counting and the advantage that the player can obtain from betting on them varies with the game and the depth to which the shoe is typically cut. European style Punto-Banco which is cut to a fixed seven cards from the end of the deck is especially vulnerable to these count methods.

WHAT TO LOOK FOR?

- Wagering on the side bet late into the shoe, or increasing the value of the wager on the side bet late into the shoe when less cards remain to be drawn.
- A different or unusual notation being used on the Baccarat score cards (scorecards are typically used to record whether the previous winning hands have been Bank, Player or Tie winners). Anything that looks different from this may be a cause of concern.

WHAT CAN BE DONE **ABOUT IT?**

- Cut the deck deeper. If more cards remain to be played when the shoe ends then the utility of all of the card counting strategies is reduced, although not eliminated. In addition due to the size of the wagers typically placed on the Bank/Player/Tie combinations this may be a self-defeating strategy.
- Identify Advantage players using these techniques and deal with them on an individual basis. This has the advantage of being a targeted response and not affecting the game for the majority of players.

Using the eConnect Baccarat module this is an easy thing to do as the major side bets are counted in real time over the Smart-Shoe to Application connection. Alerts are available to inform the Surveillance operator whenever the specific count for any of these popular side games become an advantage to the patron and video review can then be carried out to watch for anyone taking advantage of this knowledge. This makes the identification of side bet counting advantage players an easy task.

BACCARAT CHEATING, **FRAUD AND THEFT**

Once we move on from so-called Advantage Play (that arguably is not cheating although in the case of Card Sorts this will likely be determined by various court cases currently ongoing) we enter the realm of actual cheating.

THE **"CUT CARD SCAM"**

Was probably the most lucrative of all of the Baccarat scams that have become known to Game Protection Professionals. In this scam the team would manipulate the Casino staff members to aid them and then use technology to video a section of the decks about to be played, analyse this section and then plan their strategy and plays so that they could not lose.

This scam perfectly took advantage of the main weakness of Baccarat as a game, the very thing that makes it uncountable in-fact. The Tableau of card drawing rules is fixed. Therefore if the sequence of cards is known then all of the winners can be calculated and nothing can change these calculations. Extra people coming to the table to wager or leaving it make no difference. Even the burning of one or several cards have no effect as the updated sequence of winners can easily and quickly be calculated from the remaining information known.

The scam is well known so will be briefly summarised as follows:

- The gaming staff were induced to either offer the block of eight decks of a typical Baccarat shoe to be cut using either the left hand, or using the right hand but orientated vertically (let's say portrait) rather than the typical horizontal (landscape) orientation. Why? Because playing cards only have the index in the top left corners when looked at. This is the corner closes to the patron when the cards are offered with the left hand (protecting the face by orientating this back toward the dealer) or when offered vertically in the right hand with the same proviso applying.
- The person cutting the card has a small video camera strapped to his forearm oriented to view the card indexes. A long sleeved jacket was worn to hide the camera. Both video transmission and recording to flash drives was used in various iterations of the scam.
- The person cutting the card would first "wipe" the cutting card along the top of the deck "for luck". This obscured the fact that they were simultaneously peeling back the edges of the cards in sequence to expose the indexes to the video camera view. Mechanical means were known to be employed on occasion to facilitate this. The cards would then be cut to a shallow point toward one end of the deck to minimise the playing time required before the slug was reached.
- The resulting video of a slug of the deck (and this slug could consist of the majority of the eight decks on occasion) would be analysed to determine the winning sequence of cards. This information would be communicated back to the team members actually making the wagers and these wagers would be made as indicated by the known winning hands.

As related this method of cheating was extremely lucrative. It was detected however and countermeasures were put into place, certainly in Asian Casinos.

WHAT TO LOOK FOR?

The card cutting process:

- Gaming staff offering the cards to be cut with either the left hand, or vertically in the right hand.
- The individual cutting the cards wearing a jacket. Holding his cutting arm in a particularly stiff posture (so as not to disrupt the video image) and “wiping” the top of the cards using the postilion “for luck”. Anything that appears to indicate that the corners of the cards are being fanned open.
- Patrons who appear to win a predominant number of coups. Or who only lose when betting far less money than when they have a winner. This actually tends to be the first thing noticed.

WHAT CAN BE DONE ABOUT IT?

Stop people doing the first two things “to look for” above.

- Make it policy and procedure that dealers can ONLY offer the cards to be cut in a certain way.
- Only allow the Pit Boss/Manager to cut the cards.
- Use a Perspex box to hold the cards tightly so the indexes cannot be fanned or exposed (this may lead to other problems, see Back card Steering below for details).
- Use applications such as eConnect’s Baccarat module along with video review to quickly determine if betting strategy appears able to generate abnormal numbers of winners and then review all events of future play by these patrons.

VARIATIONS

CAMERAS IN SHUFFLE MACHINES OR SHOES

Variations of this scam have been detected where Casino technicians have installed small cameras in the Baccarat shoe (to view the index of the next card to be dealt) or in certain models of shuffling machine (usually small and cheap shuffling machines that replicate the actions of physical dealers and therefore expose the card index during the shuffling process). All of these scams tend also to feature some manner of collusion since the compromised shoes or shuffle machines have to be introduced to the table.

WHAT TO LOOK FOR?

- Indications of knowledge of either the first card to be drawn or of a slug of cards (excessive numbers of winning coups for the patrons) but without the indication of the cut being compromised.
- A correlation between losing shoes and the employment of either shuffling machines or specific dealing shoes; and the staff members introducing these into the game. Or winning players who always want to choose the shuffling machine or dealing shoe to be used.
- A reluctance or refusal of staff to check or maintain certain dealing shoes or shuffling machines on camera or to record their allocations.

WHAT TO DO ABOUT IT?

- Introduce a log that can be used to cross reference Dealing shoes or shuffling machines to specific gaming tables. This log should be checked regularly for any correlations that should be investigated further.
- Introduce a log so that the names of all technicians servicing gaming equipment are cross referenced with this equipment.
- Introduce a policy whereby all equipment for any major loss is impounded and is checked by both the technicians and independent, non-gaming, parties for signs of tampering.
- The refusal to employ basic shuffling machines and their substitution for MD2 or MD3 style shuffling machines that do not shuffle in a similar manner to a human being and that cannot be tampered with by the installation of a simple camera.
- The refusal to employ gaming shoes by any supplier other than authorised and trusted ones such as Angel, SHFL...etc.

CAMERAS ON TABLES

On Baccarat tables where a manual shuffle is undertaken then surface mounted cameras can be used to record the shuffle and identify the card indexes to recreate a filmed “slug of cards”. These surface mounted cameras can be disguised in cigarette packets, in phones or hidden on the body or in women’s bags. Indeed they can be anywhere where a view of the shuffle process can be obtained from a low enough angle that the card indexes are visible during the riffle.

While dealer collusion is not required for this to be a successful technique it is certainly a benefit as the riffle can be made extra slow and extra high to facilitate the filming process.

WHAT TO LOOK FOR?

- Winning betting patterns as discussed previously.
- Repositioning of bags, cigarette packets, phones or body posture during the shuffle process. Especially minor adjustment as the shuffle is ongoing.
- Dealers with a poor, slow or high riffle during shuffling. They may not be involved but they likely do need re-training.

WHAT CAN BE DONE ABOUT IT?

- Manual shuffles can be forbidden at the table under all circumstances and only large and secure shuffle machines can be used.
- No non-gaming items should be allowed on the gaming table during the shuffle process.
- Pre-shuffled cards should be used as a substitute for on-site shuffling.

DEALERS INVOLVED

Variations of this scam have been detected where gaming staff members, typically Dealers, have fanned a section of the cards themselves and have communicated this information to Player Agents. Even a relatively small slug of cards constituting no more than a couple of coups is of massive potential value in the hands of someone able to financially exploit it.

WHAT TO LOOK FOR?

- Gaming staff paying inordinate notice to the deck of cards on a dead game. Fanning them open or arranging them in a manner that exposes the index to view. Especially just before going on a break.
- Gaming staff fanning open sequences of cards during the shuffle process, if a manual shuffle is employed, or when offering the cards to be cut or at any time between these events.

WHAT CAN BE DONE ABOUT IT?

- Policies and procedures forbidding gaming staff members to “play” with the gaming cards should be strictly enforced.
- The betting patterns outlined above should be looked for, bearing in mind due to the reduced amount of information that can be known, memorised or retained, the betting pattern is likely to be several small wagers that win or lose in the usual way followed by a couple of large wagers that win. The patrons will likely leave the table once the slug is played through.

Once evidence has been identified then the necessary action can be taken.

COOLER SHOES

The more “old fashioned” method of gaining information as to the sequence of cards to be played; set that sequence up in advance and ensure that the cards are introduced into the game and not subsequently shuffled.

Due to the amounts of money that can be involved in a Baccarat scam there is always the possibility that Gaming staff are going to be compromised and allow themselves to become involved. In the case of “cooler shoes” these staff members tend to be at the level of Pit Managers/Bosses or above as they have to have been able to gain access to the Baccarat cards to be used and the authority to introduce them to a game. This tends to happen in the card transport or local storage (i.e. Pit Storage) portions of the card tracking process (the process that tracks cards from delivery to the Casino to eventual destruction).

While considered something of an old scam it is still employed and has recently been detected at some of the largest casinos in Asia.

WHAT TO LOOK FOR?

Use all of the methods described under the “Cut card scam” heading above. If the cut card scam is not taking place then something else has to be:

- The tip-off here will almost certainly be betting patterns. Patrons who appear inordinately successful in their larger wagers and who only tend to lose when betting far lesser amounts of money (occasionally employed as a camouflage method to disguise their actual play).
- Certain senior staff members paying an unusual or inordinate amount of attention to certain games, the games with these betting patterns present.
- Seals or card vaults, carriers or containers showing signs of having been tampered with; or of having been replaced by non-registered seals; or being delivered to tables unsealed. Especially if a senior staff member has already “broken the seal” to “help the dealer out”; especially if this is not common for them or is against policy and procedure.
- Review every aspect of the card delivery, card room storage and card transport process. Look for any period where the card vaults/carriers or containers are out of view. Who moved them out of view? Who brought them back into view?
- Review the period of local card storage at the Pits. Are the card stores under camera coverage? Did anyone enter them who was unauthorised? Were they kept locked at all times except when cards were being moved?
- Review all periods of local card movement, either from the local card storage to the table or inter-pit card movements. Were more vaults, carriers or containers taken than needed to be. Does the card transport computer system (if employed) detail the movements accurately. If staff members moved cards between pits, especially where these pits are at differing locations were they in view at all times? Did they rendezvous with any patrons while travelling. Did any card vaults or carriers go “missing” only to reappear later on.
- Does it appear that there was an instruction to the Gaming staff not to shuffle the cards but to use them immediately from the vault or carrier?

WHAT TO DO ABOUT IT?

- Ensure that Policy and Procedure for the storage, transport and use of playing cards is strictly adhered to.
- Introduce a policy that any card movements have to be recorded (if this is not already done).
- Ensure that all card transported is escorted and that at least two individuals are involved.
- Enforce a policy whereby the contents of no card vault, carrier or container is used if there is any evidence of tampering with the seal, the seal is not present, or the seal is not the one recorded in the system as being associated with these cards.

Gathering this evidence can quickly provide proof that a cooler shoe has been introduced and will, at least, identify the senior gaming staff member involved.

DUMPING THE **GAME**

This is an out and out collusion technique whereby the Gaming Dealer and their Player Agent(s) conspire to inflate the value of the wins of the latter while minimising the losses. This can be done by the simple expedient of overpaying winners while “forgetting” to take losers, or even of paying the bets whether they win or lose. It should be noted that this last technique mentioned is actually remarkably difficult to see on CCTV due to limits to the “theory of mind” of the Surveillance Operators (a limit shared by all people but especially relevant here).

WHAT TO LOOK FOR?

- A dealer who pays bets in a manner that obscures either the original value of the bet and/or the value of the payment. This technique can be used to disguise the fact that the bet is being over-paid and can be especially damning as evidence against the staff member if this payment method is only applied to certain patrons, but not to all of them and that otherwise payments are made in a clear and easily “readable” manner.
- A dealer who routinely “forgets” to collect certain losing bets.
- A dealer who pays losing bets. The reason that this is actually far more difficult to detect than would be thought reading about it is that the human race tends to see what it expects to see. And in watching baccarat what is expected to be seen is bets being paid or bets being taken, as bets being paid is an expected outcome it is not immediately apparent in many cases that actually the bet should have been taken, not paid. After all the potential for payment is always there.
- eConnect analysis using the ratings module and the Baccarat module can be used to identify the patrons at the gaming table and the dealer involved (and can be used to determine if there is a correlation between them being on the same table at the same time) while winning hand data can more easily break down the “expectation” of events allowing the Operator to see “what really happened”.

WHAT CAN BE DONE ABOUT IT?

All examples of proven collusion should be treated with the utmost severity with the staff member standing in breach of their fiduciary duty.

THE RIBBON CUT, BACK **CARD STEERING**

Both of these techniques probably shade into Advantage Play but both feature the patron benefitting from the knowledge of a single card value. In both cases it is the card exposed at the back of the deck before the cut that is vitally important.

Detail of the Ribbon Cut can be obtained in the links below so what I will specifically deal with is a variant of the same technique using game protection features that were introduced following the “Cut Card Scam” detailed above.

Back card steering is possible on Baccarat gaming tables that have enforced the use of Perspex card boxes to prevent the Cut Card Scam and the fanning of card indexes so that they can be viewed. The manner of construction of these boxes has, in a large number of cases, resulted in a design where it becomes possible to cut exactly 52 cards from the back of the deck. This has been noticed by some scammers who exploit this design flaw as follows.

One of the patrons attempting the scam will approach a dead game and ask to cut the cards. They will arrive at either the far left or far right gaming position. For customer service reasons the Dealer will typically offer the cards to be cut by angling the Perspex holder toward the patron. This acts to expose the bottom card to the second patron scammer who will be at the other end of the table.

As the design of the Perspex box allows exactly 52-cards to be cut out patron one will cut the eight decks one full deck from the back. The exposed card is now 52-cards from the front. The game will be played for low stakes until it becomes clear that the observed card will be dealt in the next coup at which point it's advantage to the patrons can easily be determined depending upon which position it is likely to be dealt to.

While it is a scam that only generates an advantage for one coup in 52-cards this is a far higher hit rate than the very similar Ribbon cut method and in large casinos during less busy portions of the gaming day it can be perpetrated several times per hour.

<http://www.worldgameprotection.com/the-catwalk/casino-ology/BOSVIEW/The-First-Cut-is-the-Deepest/> or
http://www.billzender.com/os/resources/media/situation_baccarat_advantage_play.pdf

WHAT TO LOOK FOR?

- The patron wishing to cut the card being at one extreme end of the gaming table while another patron, who he or she will subsequently join while wagering, is at the opposite end.
- A very careful cut card placement, just grazing the Perspex lip of the card box.
- Low stakes, quick paced but somewhat indifferent betting for the first 8-10 coups or so followed by a much larger bet for a single coup.
- Following this large bet the two original patrons will both finish betting leave the table.
- The next table they are observed at they will exhibit the same behaviours, even if the roles have been swapped.
- On live monitoring use of the eConnect Baccarat module to identify card play and low CCTV cross shots of the table to identify the exposed bottom card are both very helpful.

WHAT CAN BE DONE ABOUT IT?

- A second cutting card to hide the bottom card of the eight decks can be used.
- A policy can be enforced where the cut card cannot be placed hard up against either edge of the Perspex card box but must be placed toward the middle and that any cut card so placed by a patron will be disregarded and the cut re-performed.

CARD SWAPPING

This is an older scam and is generally not possible in the days of smart-shoes being employed on Baccarat. However it is still a completely viable technique in Casinos using traditional shoes and where the player can hold the cards in their hands during the game.

For this technique to work the scammer must first obtain a sample Baccarat playing card. This can easily be obtained during the cut card process (examples where double sided sticky-tape on the back of a Baccarat tracking card tapped lightly on the stacked decks of cards to pinch the top card have been observed for example), it does not matter what card is obtained, so long as one is.

As the game progresses the scammer will introduce the card in their hand for one of the cards dealt to them in such a manner as to provide the maximum benefit to them. They may not always win but they will act to always improve their hand or to obtain a beneficial card for the future.

WHAT TO LOOK FOR?

- An unnatural or unusual “cupping” gesture of one of the patron’s hands. The secreted card has to be both held and hidden from view and the only way for this to be done is to slightly bend it while holding it in a cupped palm.
- Moving the cards one over the other in the hand, to disguise the introduction of the palmed card for one of the dealt cards and the taking of a different dealt card.
- An unnatural pattern of winners, this will have to be obtained by manual means as, obviously, no shoe data will be available.

WHAT TO DO ABOUT IT?

- If a normal shoe game must be employed then patrons should not be allowed to hold the cards. Have the entire game simply dealer dealt.

OTHER THINGS TO THINK ABOUT

CARD SEQUENCES

While the typical reason given for recording the winning coups, “Tracking Trends” is a completely discredited technique there have, surprisingly, been at least one case where it was successful. This featured a well-known Atlantic City casino and a well-known card supplier and came about because the process by which playing cards were pre-shuffled at the factory was flawed and not followed in a certain instance.

The end result that while the cards were not in a standard deck order they were not in a random order either and the winning coups would replicate during a typical session of play, again due primarily to the non-random card sequence and fixed nature of the drawing Tableau. This was noticed by Asian players at this particular casino and was taken advantage of to win considerable sums.

It led to, in my opinion, a wholly unnecessary focus on the security of pre-shuffled cards and a reluctance to use them or procedures that would have a manual shuffle at the table prior to the game as a “security feature”. This substitute’s actual security (pre-shuffled cards) for real risk (manual shuffles on tables being filmed to identify slugs) and should be avoided.

Casino operators should weigh up security risks when selecting a card supplier and if they wish to employ pre-shuffled cards (and I would recommend that they did so) then they should select a supplier who can do this securely.

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